

Proposal Abstract:

Models proposing a magnetar origin for Fast Radio Bursts (FRBs) obtained a strong support with the remarkable observation of FRB-like bursts temporally coincident with X-ray events from the Galactic magnetar SGR~1935+2154 during an outburst. Monitoring active magnetars at high and low energies simultaneously in order to detect X-ray burst coincident with (or slightly lagging) radio emission is one of the best way to gain new insight into the emission mechanism responsible for (at least some) FRBs. However, our current statistics about magnetars exhibiting sporadic and/or pulsed emission at radio frequencies are very limited. Furthermore, only half of those objects have been observed simultaneously in the X-ray/radio, and in most cases a significant gap occurred between the initial X-ray activation and the first contemporaneous X-ray/radio follow-up. This target-of-opportunity proposal asks for FAST observations simultaneous with Einstein Probe X-ray satellite of a neutron star showing magnetar-like activity entering an outburst state, with the aim to identify coincident X-ray/radio bursts and characterize their energetic, spectral and temporal properties in order to establish the link magnetar-FRB link. This proposal will also shed light on the radio emission mechanisms within the magnetar population and how it relates to ordinary radio pulsars.